

Attorney Docket No. 29195-8174US1
SEMITOOL REF No. P98-0027US2

Amendment to the Claims

Claims 1-51 (Canceled)

52. Cancel

53. Cancel

54. Cancel

55. Cancel

56. Cancel

57. (Previously Presented) A method of fabricating interconnect metallization structures on a workpiece, comprising:

applying a conductive barrier layer to the workpiece in a film deposition tool set;
forming a patterned resist layer on the workpiece, the patterned resist layer being a mask having openings in a pattern of interconnect metallization structures;

plating a metal into the openings of the resist layer in a wet processing tool set to form the interconnect metallization structures; and

altering portions of the barrier layer to electrically isolate the interconnect metallization structures from each other in the wet processing tool set.

58. (Previously Presented) The method of claim 57 wherein plating a metal into the openings comprises electroplating copper onto exposed portions of the barrier layer in the openings.

Attorney Docket No. 29195-8174US1
SEMI TOOL REF No. P98-0027US2

59. (Previously Presented) The method of claim 57 further comprising applying a seed layer onto the barrier layer in the film deposition tool set, and wherein (a) the openings in the resist layer expose portions of the seed layer and (b) plating a metal into the openings comprises electroplating copper onto the exposed portions of the seed layer.

60. (Previously Presented) The method of claim 57 further comprising electroplating a protective layer onto surfaces of the interconnect metallization structures.

61. (Previously Presented) The method of claim 57 wherein altering portions of the barrier layer to electrically isolate the interconnect metallization structures from each other comprises oxidizing portions of the barrier layer between the interconnect structures.

62. (Previously Presented) The method of claim 57 wherein altering portions of the barrier layer to electrically isolate the interconnect metallization structures from each other comprises removing portions of the barrier layer between the interconnect structures.

63. (Previously Presented) The method of claim 57 further comprising applying a seed layer onto the barrier layer in the film deposition tool set, and wherein altering portions of the barrier layer to electrically isolate the interconnect metallization structures from each other comprises oxidizing portions of the barrier layer between the interconnect structures.

64. (Previously Presented) The method of claim 57 further comprising applying a seed layer onto the barrier layer in the film deposition tool set, and wherein altering portions of the barrier layer to electrically isolate the interconnect metallization structures from each other comprises removing portions of the barrier layer between the interconnect structures.

Attorney Docket No. 29195-8174US1

SEMITOOL REF NO. P98-0027US2

65. (Previously Presented) A method of fabricating metal interconnect structures on a workpiece, comprising:

applying a barrier layer to the workpiece in a first deposition station of a film deposition tool set;

applying a copper seed layer to the barrier layer in a second deposition station of the film tool set;

forming a patterned mask of a resist on the copper seed layer, the patterned mask having a plurality of openings defining locations for forming raised metal interconnect structures on the seed layer;

plating copper onto the copper seed layer in the openings of the patterned mask in a first wet processing station of a wet tool set to form copper interconnect structures;

removing the patterned mask in second wet processing station of the wet tool set; and

removing portions of the seed layer between the copper interconnect structures in a third wet processing station of the wet tool set.

66. (Previously Presented) The method of claim 65 wherein plating copper onto the copper seed layer comprises electroplating copper.

67. (Previously Presented) The method of claim 65 wherein:
plating copper onto the copper seed layer comprises electroplating copper; and
removing portions of the seed layer between the copper interconnect structures comprises etching the copper seed layer.

68. (Previously Presented) The method of claim 65 wherein:
plating copper onto the copper seed layer comprises electroplating copper; and
the method further comprises exposing the workpiece to an oxygen-containing environment to form a first oxide on the copper interconnect structures and a second oxide between the copper interconnect structures, removing

Attorney Docket No. 29195-8174US1

SEMITOOL REF No. P98-0027US2

the first oxide over the copper interconnect structures, and plating a protective layer onto surfaces of the copper interconnect structures.

69. (Previously Presented) The method of claim 68 wherein removing portions of the seed layer between the copper interconnect structures comprises removing the second oxide from between the copper interconnect structures.